Global Hemp Solutions

1. Basic data

1.1. Processing capabilities:

- Hemp processing :
  - Input capacity: up to 7000 kg/h
  - Output: Technical fibres containing less than 5% of core material, baled in bales (in general we get below 2%).
  - Output: Clean core (hurd material), baled in 20 kg bags.
  - Output: Short fibres with up to 35% of core in them (related to the weight of the short fibres) in bales.
  - Output: Dust in bulk.
- Input capacity per day: up to 140 metric tons per day.

1.2. Given:

- Bales: Round bales with max. dimensions Ø1800 mm (width up to 1400 mm).
- Rectangular bales with max. dimensions 1200x1200x2400 mm.
- Bulk material can also be fed in the line.
- Minimum bale weight to obtain the capacity: 300kg/bale
- Moisture content: between 13% and 18% (everywhere in the bale)
- Yellow colour, dry or retted to a light grey colour; if the input material is green (green flexible stalks), the result will be bad. If the straw is over-retted the quantity of dust will be much higher.
- If the humidity of the material is higher than 18%, you will risk blocking of the line, reducing the capacity and possibly damaging the equipment.
- Operation: 24h/day – 5days/week
- The line has an operational efficiency of minimum 85%.

1.3. REMARKS:

- Cleanliness: when we talk about 2% of core in the fibre, this means that of the total amount of technical fibre there is 2% of core in there. So 100 kg of technical fibre contains max. 2 kg of core. So it is never related to the total amount of core in the plant.

- The following equipment is being used by Hempflax, La Chanvrière de l'Aube, Cavac, AITF, Natural Fibers, ...
- The modular composition of the line allows easy modification if and when it is needed.
- Our equipment has proven its reliability and its performance on many levels during the past decades. We have built in the highest possible flexibility in terms of output material.
- The equipment is very efficient in decortication and in energy use because of the fact that all main motors are on frequency drive in order to avoid losses at partial load.
- Due to the fact that everything works in suction, there the dust level in the production room is very low, even if ductwork would have a puncture due to the wear. The fans are high efficiency fans which are running under optimal conditions and because they are placed in the clean air side there is no wear on the fans.
- The operation is visualised so that almost anyone can operate the system after a short training.
- The set-up is very compact and maintenance is quite easy.

2. Part 1 : feeding and decortication.

2.1. Process:

2.1.1. Input: round bales of hemp straw or rectangular bales.

2.1.2. Output:

- Fibre containing approx. 20% of core (core) – in bulk
- Uncleaned core in bulk
- Dust in bulk

2.1.3. **Important remark** : in case you can work only with square bales of pre-cut straw (max straw length of 600 mm) there is considerable savings possible (approx. 300000 euro savings because the guillotines can be omitted).

2.2. Feeding and decortication

- Storage conveyor 10 m long.
- Double guillotine cutter.

- Dust suction hoods at the exit of the guillotines.
- Transfer conveyor, inclined, length 7.5 m.
- First straw opener for coarse opening of the straw.
- Followed by the second straw opener for final opening and feeding of the line.

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Single straw opener

- First decorticator type CRD1301-DS.

Decorticator

- Spark detection with control system and material output valve + filter protection valve.

Simple straw opener

Decorticator inside sound damping enclosure

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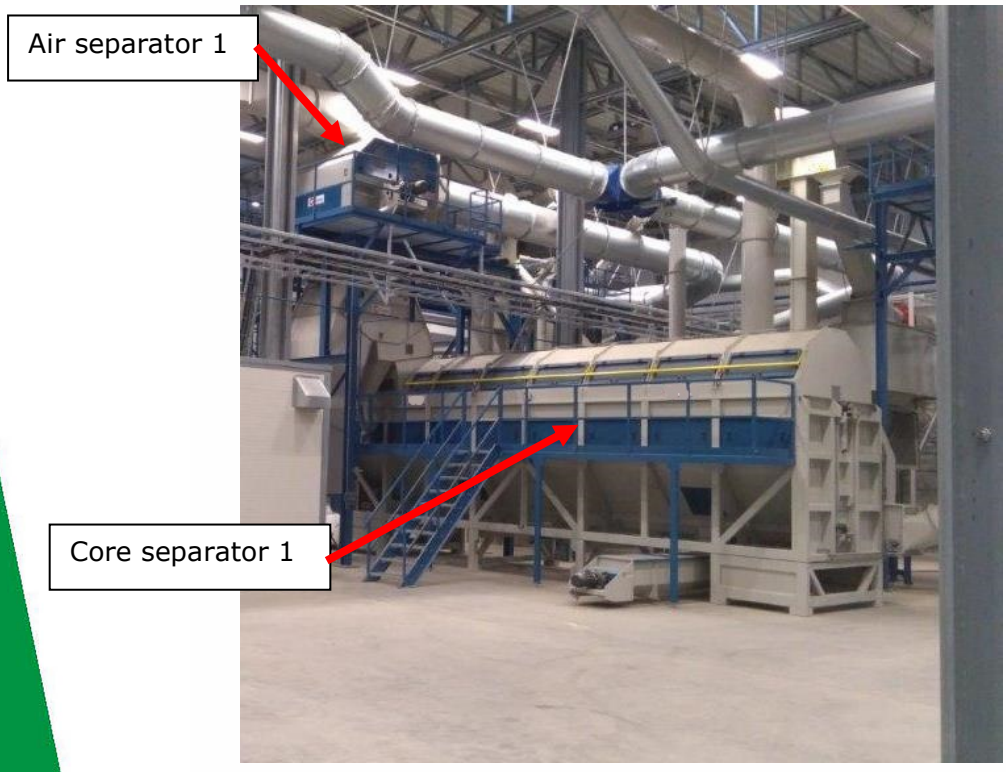
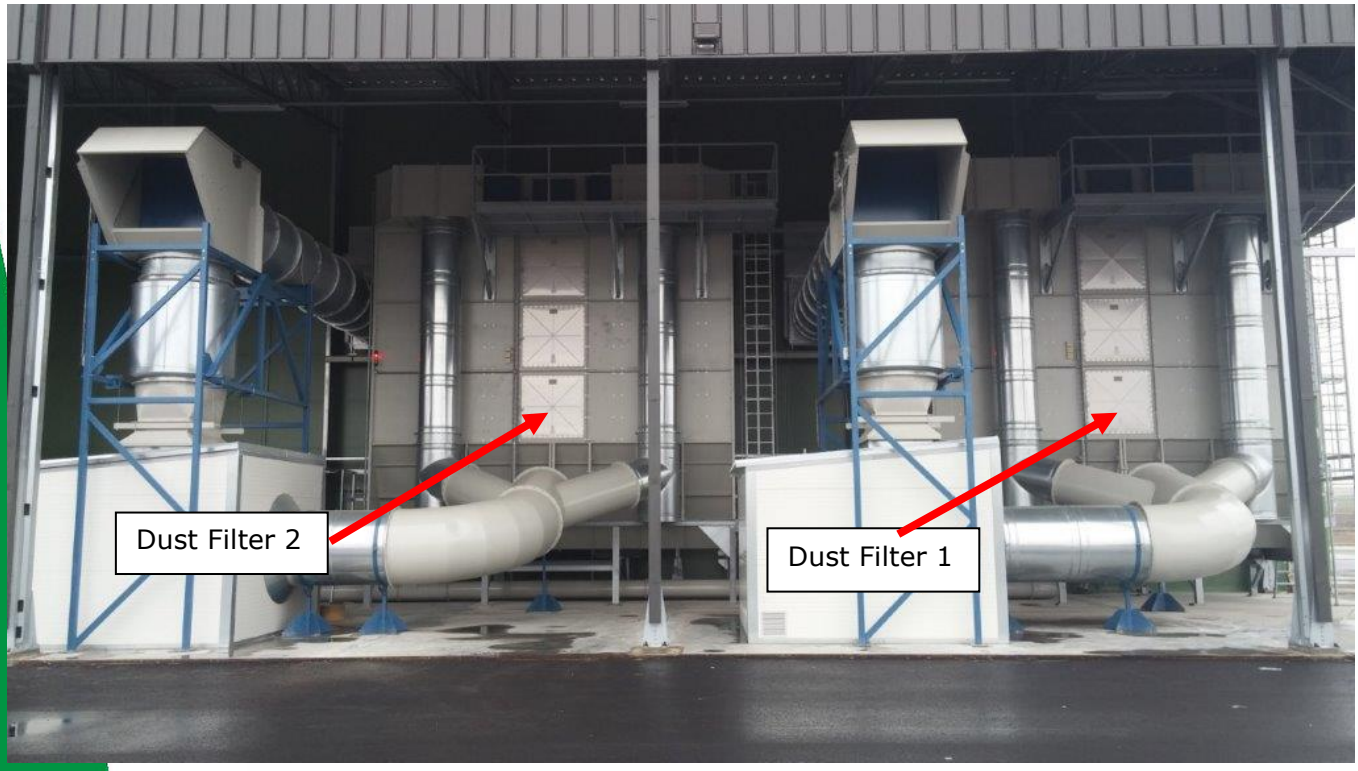
- Air separator 1: RK1815.
- Supporting structure, platform, access ladder for this air separator.
- Core separator 1: DIII-10M.



- Second decorticator type CRD1302-IDS.
- Spark detection with control system and material output valve + filter protection valve.
- Second air separator type RK1810.
- Supporting structure, platform, access ladder for this air separator.
- Second core separator type DIII-10M.
- Core augur: length 8 m.
- Elevator: height +/- 8 m.
- Sound damping enclosures for the decorticators.
- Coupling parts.
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices, programming.
  - Many motors are driven by frequency inverters in order to have flexibility in adjustment and also in order to save energy.
- Lay-out and engineering.
- Installed power in this part: 646 kW – 60Hz – 3x480V+E+N.

2.3. Filtration for Feeding and decortication

- Dust filter: automatic bag filter, type « pulse jet », with platform and ladder, capacity of 75000 m³/h.



- Rotating air lock at the bottom of the filter.
- Fan 1: suction fan.
- Connection between fan 1 and filter 1.
- Dust fan.
- Dust separation cyclone, with support structure and with rotating air-lock at the bottom.
- ATEX anti-return valves on the connections to the filter.
- Dust control sensor at the outlet of the filter: detects when too much dust comes out the clean side (this may happen when a bag is punctured or loose).
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices.
  - Fan 1 driven by a frequency inverter in order to have flexibility in adjustment and also in order to save energy.
- Installed power in this part: 158 kW –60Hz – 3x480V+E+N.

2.4. Ductwork

- Ductwork can be determined when the exact lay-out is finished.
- We are including a budget for making the drawings for the ductwork and also for the ductwork itself. However, it will be more interesting to have the ductwork made locally.

2.5. Cables and cable trays

- Cables and cable trays can be determined when the exact lay-out is finished.
- We are including a budget for this but it will be more interesting to purchase this locally.

2.6. Transport and installation

- Transport by 40ft container (OT-HC) overseas and train/truck on land: estimation of the cost until the state of Kentucky, USA. Final price to be determined when the exact location is known.
- Budget for supervision of mechanical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Budget for supervision of electrical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Start-up, commissioning and training of staff.

3. Part 2 : Fibre baling.

3.1. Process:

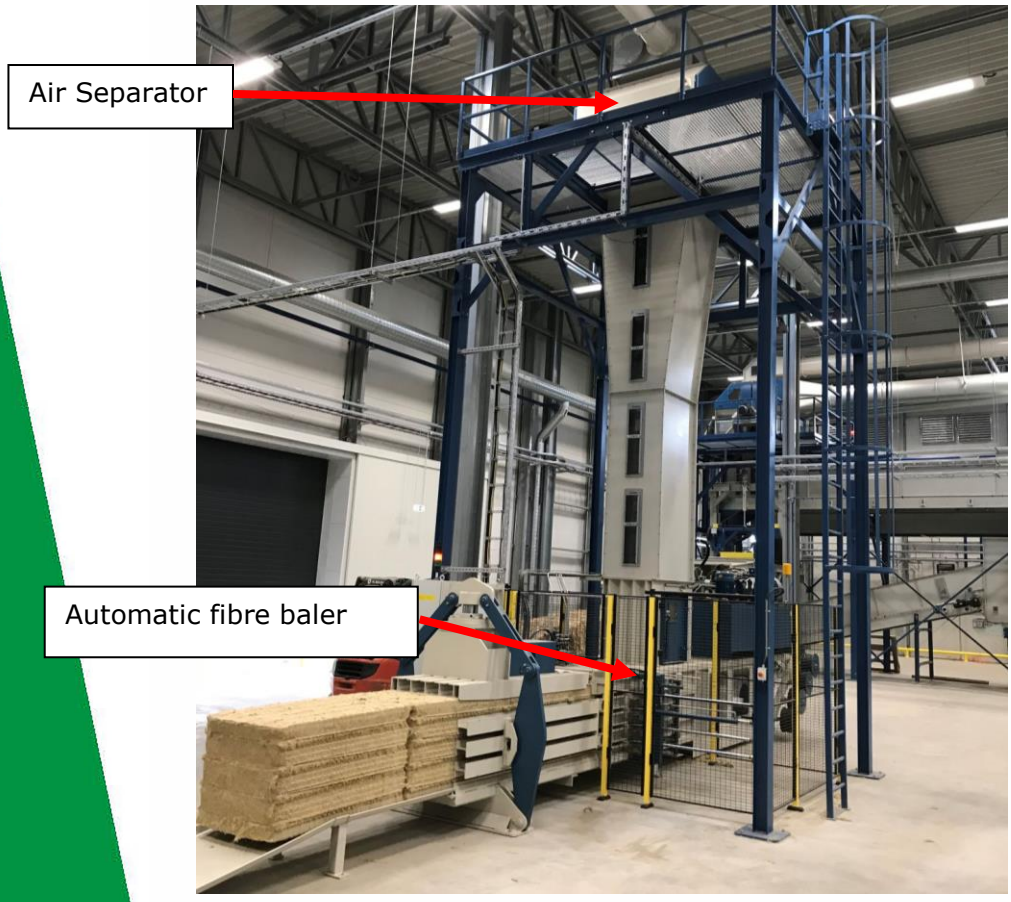
3.1.1. Input: fibre coming from the refining section

3.1.2. Output: bales of fibre – dimensions see below.

- Weight of the bales depends on the degree of core in the fibre.

3.2. Technical fibre baling

- Air separator 5: RK1410 + supporting structure, platform, access ladder.
- Baling press for technical fibre: Automatic baling press C40: bales 735x765 – length is adjustable but generally around 1100 mm. Metal wire strapping.
- The air separator 5 and the baling press for technical fibre are large enough so that they can remain when the line is being expanded.
- Coupling parts.
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices.
- Installed power in this part: 61 kW – 60Hz – 3x460V+E+N.



- When you want to bale decorticated, unrefined fibre, containing approx. 20% of core, you need to have two of these balers with their air-separator. One for the unrefined and one for the refined fibre.

3.3. Transport and installation

- Transport by 40ft container (OT-HC) overseas and train/truck on land: estimation of the cost until the state of Kentucky, USA. Final price to be determined when the exact location is known.
- Budget for supervision of mechanical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Budget for supervision of electrical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Start-up, commissioning and training of staff.

4. Part 3 : fibre cleaning and refining.

4.1. Process:

4.1.1. Input: bulk decorticated fibre containing approx. 20% of core.

4.1.2. Output:

- Fibre containing max. 5% of core (core) – in bulk (in general with good quality straw the remaining core content is between 1% and 2%)
- Uncleaned core in bulk
- Dust in bulk

4.2. Cleaning and Refining

4.2.1. Air separator RK1410 + supporting structure, platform, access ladder.

4.2.2. Distribution conveyor left-right to feed refining line 1 or refining line 2.

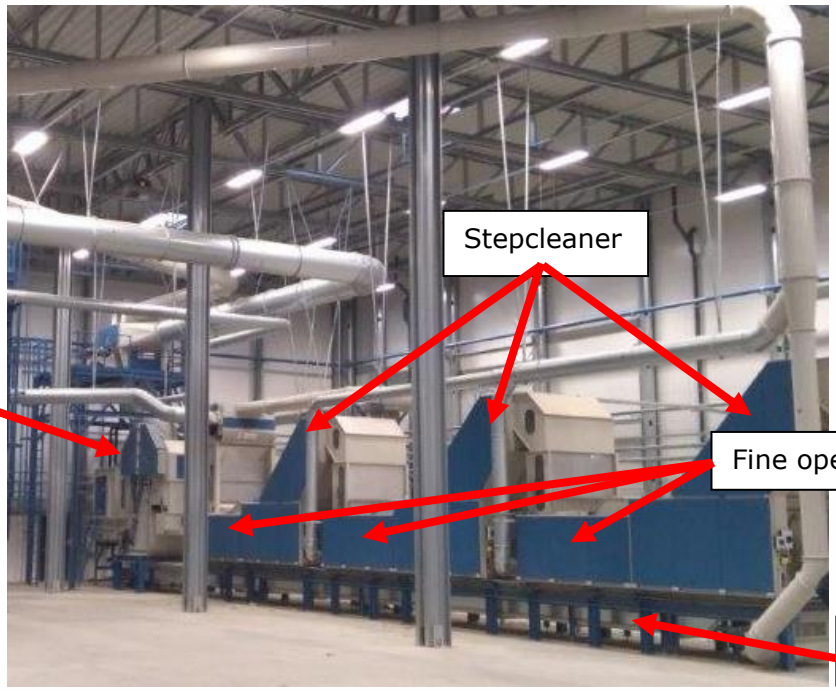
4.2.3. Buffer conveyors: one in front of each refining line.

4.2.4. There are two refining lines, each composed of the following items:

- Hopper feeder: CH1500 with entry and exit conveyor, as well as a transversal conveyor.

- Fibre fan: fan Z703.
- Metal detection: detects inline in the ductwork and is equipped with a fast acting valve to export contaminated material.

- 3 fine openers combined with 3 step cleaners.



- Support under refining line and hopper feeder to place them higher to put the core conveyor underneath.
- Core conveyor: length 16 m – equipped with a suction at the end to bring core and short fibres in the circuit towards air separator 6.
- Coupling parts.
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices, programming.
  - Many motors are driven by frequency inverters in order to have flexibility in adjustment and also in order to save energy.
- Lay-out and engineering.
- Installed power in this part: 290 kW – 60Hz – 3x480V+E+N.
- Dust filter: automatic bag filter, type « pulse jet », with platform and ladder, capacity of 75000 m³/h.

Rotating air lock at the bottom of the filter: disposes the dust in the pneumatic circuit.

4.3: Filtration for cleaning and refining and capacity for core cleaning

- Suction fan.
- ATEX anti-return valves on each connection to the filter.
- Dust control sensor at the outlet of the filter: detects when too much dust comes out the clean side (this may happen when a bag is punctured or loose).
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices.
  - Suction Fan driven by a frequency inverter in order to have flexibility in adjustment and also in order to save energy.
- Installed power in this part: 135 kW –60Hz – 3x480V+E+N.

4.4. Ductwork

- Ductwork can be determined when the exact lay-out is finished.
- We are including a budget for making the drawings for the ductwork and also for the ductwork itself. However, it will be more interesting to have the ductwork made locally.

4.5. Cables and cable trays

- Cables and cable trays can be determined when the exact lay-out is finished.
- We are including a budget for this but it will be more interesting to purchase this locally.

4.6. Transport and installation

- Transport by 40ft container (OT-HC) overseas and train/truck on land: estimation of the cost until the state of Kentucky, USA. Final price to be determined when the exact location is known.
- Budget for supervision of mechanical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Budget for supervision of electrical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Start-up, commissioning and training of staff.

6. Part 4 : core (hurd) cleaning.

6.1. Process:

6.1.1. Input:

- Flow 1 : core coming from the decortication.
- Flow 2 : core coming from the refining.

6.1.2. Output:

- Clean core (dust extracted and low fibre content)
- Short fibres containing 35% of core (total amount of this fraction is below 6% in case of good raw material)
- Dust in bulk

6.1.3. Core cleaner 1:

- Elevator 2 : height +/- 8 m.
- Core augur 3: length 9m – feeding clean core to the core baler.

6.1.4. Core cleaner 2:

- Air separator 6: RK1410 + supporting structure, platform, access ladder. Receiving core and short fibre from the refining line1.
- Core augur 2: length 6 m.

6.1.5. Other:

- Coupling parts.
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices.
  - Some motors are driven by frequency inverters in order to have flexibility in adjustment and also in order to save energy.
- Installed power in this part: 25 kW – 60Hz – 3x480V+E+N.

- The needed filtration capacity is available in the filter from the fibre cleaning and refining part. In case there is no fibre cleaning and refining, the core cleaning section and the filtration for this part have to be reviewed.

6.2. Ductwork

- Ductwork can be determined when the exact lay-out is finished.
- We are including a budget for making the drawings for the ductwork and also for the ductwork itself. However, it will be more interesting to have the ductwork made locally.

6.3. Cables and cable trays

- Cables and cable trays can be determined when the exact lay-out is finished.
- We are including a budget for this but it will be more interesting to purchase this locally.

6.4. Transport and installation

- Transport by 40ft container (OT-HC) overseas and train/truck on land: estimation of the cost until the state of Kentucky, USA. Final price to be determined when the exact location is known.
- Budget for supervision of mechanical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Budget for supervision of electrical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Start-up, commissioning and training of staff.

7. Part 5 : Short fibre baling.

7.1. Process:

7.1.1. Input: short fibre loaded with core, coming from the second core cleaning.

7.1.2. Output: bales of fibre – dimensions see below.

- Weight of the bales depends on the degree of core in the fibre.

7.2. Short fibre baling

- Air separator 7: RK1410 + supporting structure, platform, access ladder.
- Baling press for short fibre: Manual baling press H15: bales 735x765 – length is around 1000 mm. Manual metal wire strapping.

- Coupling parts.
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices.
- Installed power in this part: 16 kW – 60Hz – 3x480V+E+N.

7.3. Transport and installation

- Transport by 40ft container (OT-HC) overseas and train/truck on land: estimation of the cost until the state of Kentucky, USA. Final price to be determined when the exact location is known.
- Budget for supervision of mechanical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Budget for supervision of electrical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Start-up, commissioning and training of staff.

8. Part 6 : Core baling.

8.1. Process:

8.1.1. Input: Core from the core cleaning system.

8.1.2. Output: 20 kg bags of core.

8.2. Core baling

- Air separator : RK908 + supporting structure, platform, access ladder.
- Receiving buffer with augurs – 0,8 m³.
- Weighing bunker with pneumatic valves and augurs – 0,25 m³.
- Vertical compression unit.
- Horizontal compression unit with hydraulic slide.
- Bags made from rolls of PE foil:
  - The foil is put over a formation shoulder and pulled over a rectangular tube.
  - A longitudinal seal bar seals at the top.
  - A transversal bar seals at the bottom.
- The compressed core is pushed in the formed bag and the transversal bar seals also the top.
- A roller conveyor brings the bale to the exit of the machine.
- Coupling parts.
- Electrical cabinet, wiring on the machines, detections on the machines, safety devices.
- Installed power in this part: 95 kW – 60Hz – 3x480V+E+N.

8.3. Transport and installation

- Transport by 40ft container (OT-HC) overseas and train/truck on land: estimation of the cost until the state of Kentucky, USA. Final price to be determined when the exact location is known.
- Budget for supervision of mechanical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Budget for supervision of electrical installation. This is a budget. We usually work per hour because this is the most honest way of working.
- Start-up, commissioning and training of staff.

8.4. Optional : robot to stack the bales and pallet wrapping

- In general this is standard equipment that can be purchased locally but we include the budget for this in option.

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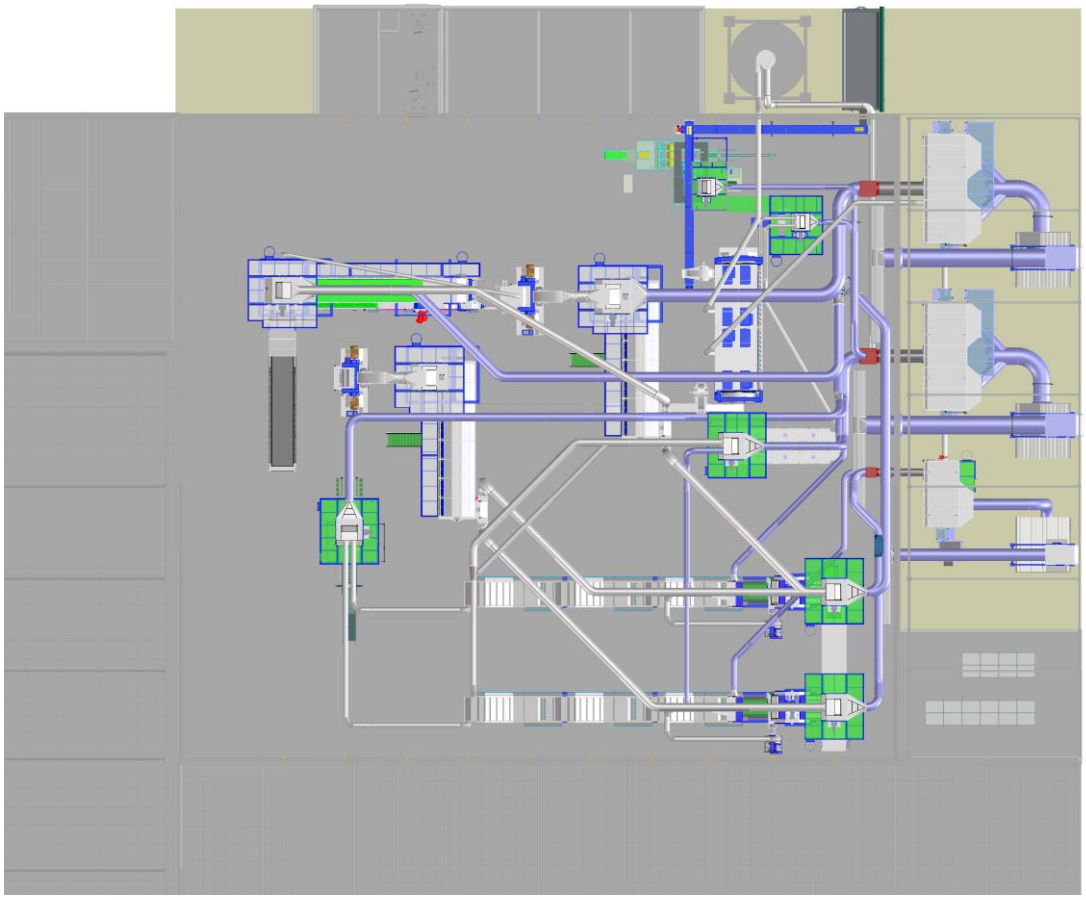

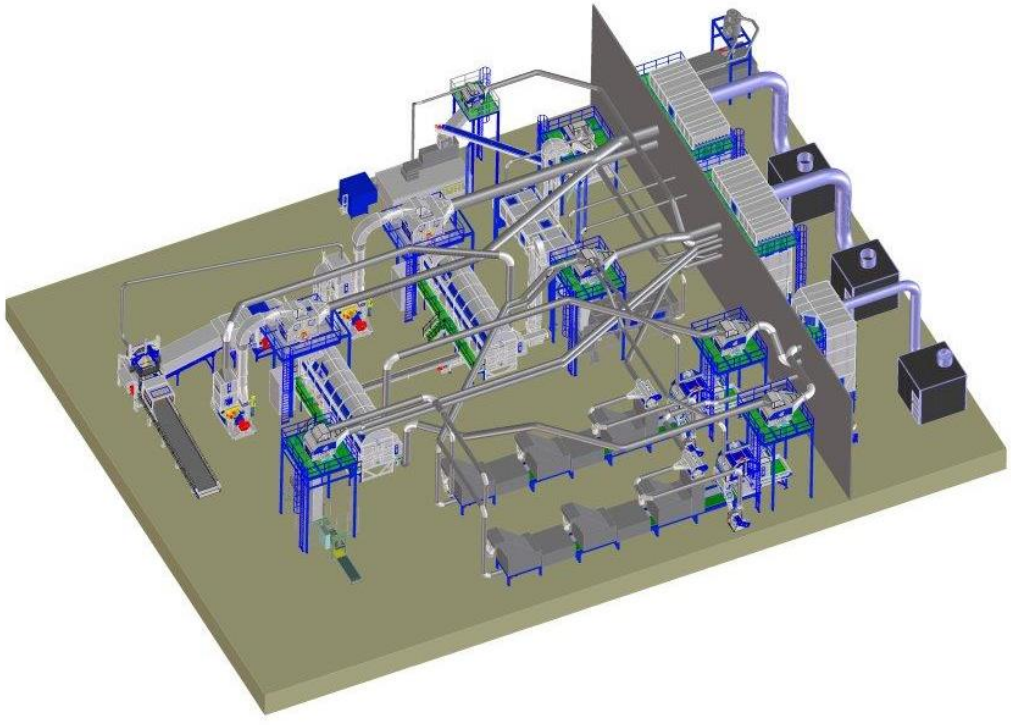

EXAMPLE OF A 7 TPH SYSTEM – the lay-out for the described system in this offer is slightly different

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9. Operation of the system:

- Round or square bales to be put on the storage conveyor.
- Each bale is first being cut in the middle by the first guillotine (operator action) and then the straw is cut in slices of approximately 40 cm.
- The transfer conveyor feeds the straw to the first straw opener that does coarse opening of the packages of straw and then the straw goes to the final opener for feeding to the line.
- At the exit of the final opener, the heavy parts like rocks, stones, metal, … fall down in a bin, the straw is aspirated to the first decorticator.

- The straw passes through the first decorticator and out comes a mixture of fiber and core.
- A spark detection is acting as fire safety device. When it is activated, a valve is switching under the first air separator and throws the material out and another valve is cutting off the duct to the filter unit in order to protect it from fire.
- The first air separator is bringing the mixture of fiber and core to the first core separator.
- Inside the first core separator, as much core as possible is extracted from the mixture so that at the exit of first core separator comes fiber with still a considerable amount of core.
- This fiber needs to be decorticated a second time to detach a maximum of core.
- The mixture passes through the second decorticator.
- Also here there is a spark detection.
- The second air separator is bringing the mixture of fiber and core to the second core separator.
- After this mode the fiber contains approximately 15% of core (depending on the quality of the straw – in general not more than 20%).

- This fiber is going to buffer conveyors in front of the refining lines by means of an air separator. In case there is no refining part included the fiber needs to be moved either to a baler or to a processing system following this line.
- The core coming out of the core separators is transported with a core augur and elevator to the first core cleaner.
- The first core cleaner is removing dust and fibers from the core. The dust goes to the filter, the short fibers still contain a lot of core (35% related to their weight)
- These are aspirated to the second cleaning drum.
- An elevator and a core augur transport the clean core to the bulk storage or in option to an automatic baling press where the core is baled in bags of 20 kg (baling press not included).

- Each refining line is receiving the material in a regular way.
- At the front of each refining line there is hopper feeder that opens the fiber and feeds it in a regular way to a fan that blows the fiber to the refining line.
- Before entering the refining line, the fiber passes through a metal detection and separation system in order to protect the refining line.
- The fiber passes through the refining line and is transported by means of an air separator to the automatic baling press for technical fiber.

- The core and short fibers from the refining line are aspirated to an air separator that discharges them in the second core cleaner.
- We keep this material separately from the core that comes from the decortication because in the core from the refining line there is much more short fiber and we do not want to contaminate core with low fiber content (decortication) with core with high fiber content.
- The core from the second core cleaner is transported through a core augur to the first core cleaner.

- The short fiber (with 35-45% of core) is transported to the short fiber baling press.

- The air + dust from the pneumatic transport systems (air separators) is aspirated to filter units that are placed under negative pressure by fans. Dust filter 1 and 2 + fan 1 and 2.
- The dust coming out of filter 1 and 2 is blown to a dust separation cyclone by means of a dust fan.

10. General technical specifications:

10.1. Manuals and maintenance instructions:

- Are delivered by CRETES, written in English, after final commissioning and in digital format (PDF)
- On request, we can provide the manuals in other languages, but extra translating costs will be invoiced.

- Unfinished equipment as described in the European Directive 2006/42/EG are delivered with a Declaration by the Manufacturer of the type Annex II.1.B from this Directive. The person completing this equipment or implementing it in the installation for which it is intended, is responsible for the CE-marking and this only after evaluation of the remaining risks and the reduction of these risks to an acceptable level.
- Completed equipment/installations as described in the European Directive 2006/42/EG are delivered with a EC Declaration of Conformity of the type Annex II.1.A from this Directive.

10.2. Finishing:

- Standard CRETES finishing and colors:
- Machines and parts: RAL 7044 (silk grey) and RAL 5009 (blue azure)
- Safety items: RAL 1023 (traffic yellow)

10.3. Electric:

- Required power supply: 3x480 VAC - 60Hz, +N, +E.
- Standard European components (mainly Siemens).
- Installed power : 1410 kW – power consumption at full capacity : approx. 1000 kW per hour.

10.4. Space and operators:

- Operators: 4 persons: 1 operator for the guillotine cutter, 1 supervisor, 1 man feeding bales and 1 man taking away finished products.

- Required space: We have managed to make a very compact lay-out. It is however best to make the building directly large enough for the expansion.
  - 1 building of 50 m wide and 60 m long, 10 m high – 1 annex building for the filtration of 12 m wide and 40 m long, also 10 m high.
  - Ware housing for raw material: make sure to have at least storage for 1 week on site.
  - Ware housing for finished products: to be determined according to your sales conditions.

10.5. Compressed air:

Compressed air quality should be in accordance with standard DIN ISO 8573-1:

- Max particle size: 0.1micron – class 1
- Dew point (pressure): -20°C – class 3 min.
- Oil content: max. 0.01mg/m³d – class 1
- Min. required working pressure: 8bar
- For the full processing line you will need 300 Nm³/h.

11. Price overview:

11.1. PART 1

Description	Price in euro (€)
Feeding and decortication + filtration	€2 330 000,00
Making the drawings for ductwork	€20 000,00
Budget estimation for the ductwork – to be purchased locally	*€200 000,00*
Estimation of cables and cable trays (to be purchased locally)	*€165 000,00*
Estimation of packing, loading and transportation	*€170 000,00*
Budget for supervision of mechanical installation (customer to provide free of charge for Cretes 4 skilled mechanics)	*€145 000,00*
Budget for supervision of installation of the ductwork (customer to provide free of charge for Cretes 4 skilled mechanics for ductwork)	*€65 000,00*
Budget for supervision of electrical installation (customer to provide free of charge for Cretes 4 skilled electricians)	*€95 000,00*
Budget for start-up, commissioning and training of the staff (staff needs to be available all the time during this period)	*€125 000,00*

11.2. PART 2

Description	Price in euro (€)
Cleaning and refining + filtration	€2 500 000,00
Making the drawings for ductwork	€15 000,00
Budget estimation for the ductwork – to be purchased locally	*€75 000,00*
Estimation of cables and cable trays (to be purchased locally)	*€110 000,00*
Estimation of packing, loading and transportation	*€150 000,00*
Budget for supervision of mechanical installation (customer to provide free of charge for Cretes 4 skilled mechanics)	*€100 000,00*
Budget for supervision of installation of the ductwork(customer to provide free of charge for Cretes 4 skilled mechanics for ductwork)	*€25 000,00*
Budget for supervision of electrical installation (customer to provide free of charge for Cretes 4 skilled electricians)	*€66 000,00*
Budget for start-up, commissioning and training of the staff (staff needs to be available all the time during this period)	*€45 000,00*

11.3. PART 3

Description	Price in euro (€)
Feeding + baling press	€173 000,00
Estimation of packing, loading and transportation	*€10 000,00*

11.4. PART 4

Description	Price in euro (€)
Core cleaning	€385 000,00
Making the drawings for ductwork	€7 000,00
Budget estimation for the ductwork – to be purchased locally	*€25 000,00*
Estimation of cables and cable trays (to be purchased locally)	*€30 000,00*
Estimation of packing, loading and transportation	*€30 000,00*
Budget for supervision of mechanical installation (customer to provide free of charge for Cretes 4 skilled mechanics)	*€22 000,00*
Budget for supervision of installation of the ductwork(customer to provide free of charge for Cretes 4 skilled mechanics for ductwork)	*€4 000,00*
Budget for supervision of electrical installation (customer to provide free of charge for Cretes 4 skilled electricians)	*€24 000,00*
Budget for start-up, commissioning and training of the staff (staff needs to be available all the time during this period)	*€25 000,00*

11.5. PART 5

Description	Price in euro (€)
Feeding + baling press short fibers	€83 000,00
Estimation of packing, loading and transportation	*€10 000,00*

11.6. PART 6

Description	Price in euro (€)
Core baling	€385 000,00
Optional: automatic putting bales on pallets, top sheet dispenser and wrapping of pallets : this quotation is a budget estimation	€220 000,00
Estimation of packing, loading and transportation	*€10 000,00*
Budget for supervision of mechanical installation (customer to provide free of charge for Cretes 4 skilled mechanics)	*€22 000,00*
Budget for supervision of electrical installation (customer to provide free of charge for Cretes 4 skilled electricians)	*€24 000,00*
Budget for start-up, commissioning and training of the staff (staff needs to be available all the time during this period)	*€25 000,00*

12. Commercial conditions:

Pricing	All prices are in euro (€) and excluding VAT and/or other taxes
Delivery	EXW – (DAP estimation of cost included)
Delivery term	To be discussed (depends on actual work load) : in general 12 months after down payment and submission of bank guarantee.
Payment conditions	40% due, against invoice and confirming the order 60% when the equipment is placed at your disposal in our workshop - we need our customer to provide a bank guarantee of a premium bank stating that 60% of the amount is covered and will be paid upon notice that the equipment is ready. Partial shipments and payments allowed. Supervision and transport to be paid at 30 days after invoice date
Not included	Mounting and assembly on site, travel expenses, cost of living: budgets were given for supervision. Ductwork: only an estimation was given. Cables and cable trays: only an estimation was given. Electrical distribution board and cabling to the electrical cabinets of the different sections. Compressed air system and connection to it. Lifting & hoisting equipment. Civil engineering and works. Packing, transport and insurance: budget was given. Unloading of the trucks and transport to the construction site ATEX: Our standard equipment is not fit for use in areas designated as zone 0, 1, 2 or 20, 21, 22 as described in the directive 1999/92/EG which deals with explosion risks. At the presentation of the risk assessment we preserve all rights to submit a modified offer.
Warranty	Duration: 1 year – on parts and labour
Mounting & start-up	The complete site must be cleaned and set free to enable the mounting and assembly in a practical and safe way.

Our company

Global Hemp Solutions is your all inclusive post-harvest processing and extraction equipment provider. We have partnerships with some of the world's largest and best manufacturers. We not only provide you with the best equipment to help make you successful, we are there every step of the way even after the installation of the equipment. We value long term relationships and are truly here to serve you.

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All prices and shipping times subject to change. Please contact us for updated lead times and pricing.